will help us to understand the kindergarten child?

3. What are the first impulses? What are the first things that attract attention? Color. Light. Movement. Sound. Bodily signs of attention. Mental and bodily effects of attention. Periods of activity. Length. Intensity. Effort. Describe the mind and body movement in the following actions: Start at a loud noise, first effort to follow a moving light, to grasp a ball, to sit erect.

What is the spur to repetition? What is the mental and bodily effect of each successful attempt? By what process does a child learn to direct his movements? Can an infant get the class of notions that we express by such words as far, near, high, low, up, down, fast, slow, here, there, large, small, hard, soft, without bodily motion? What part does similarity play, and what contrast?

Describe one of the earliest acts in which you think you can trace the following as parts of one process: Feeling of pleasure or pain, controlled motion, distinct images.

References on Instinct and Impulse: *Mental Development in Early Infancy*, Dewey; see Transactions Illinois Society for Child Study, Vol. IV, No. 3; *Infant Mind*, pp. 135–140, Preyer; Briefer Course, pp. 392–406, James; *Outlines of Psychology*, p. 278, Wundt.

Department of Natural Science

Ira B. Meyers Wilbur S. Jackman Charles W. Carman

The Professional School

It is the aim of the work in this department to afford to students preparing to teach whatever assistance there is to be derived from a study of natural science. Broadly speaking, the work is comprehended under three heads, namely: (1) Psychology — involving a study of the development of the mind under the stimulus of its nature-environment; (2) Pedagogy, involving an investigation of the inter-relations of the so-called subjects of study and a careful development of methods of teaching; (3) History of Education, showing the part that man's interpretation of nature has taken in the development of the race.

All of these studies will be pursued in the light of observations that the students can make for themselves upon nature, and in the various class-rooms of the academic department. Those who desire to prepare themselves for teaching in high or normal schools, or for college work, will be required, in addition to the ordinary qualifications for admission, to extend their studies through to one year's high-grade work in the academic school in the special subject chosen, or to present undoubted evidence of fitness for such training.

The Academic Department.

Courses of study are offered in the secondary school which will fit the students to enter the first-class colleges and technical schools of the country. The contact of the students with nature will remain unbroken, but the work, resting upon the broad basis of the earlier years' observation, will be specialized each year upon some particular lines of investigation. To this end a large amount of laboratory work will be required. The following outlines indicate the nature of the work planned for October.

BIOLOGY: A study of the micro-organisms of stagnant water; a study of the cell as a unit in the living organism, illustrated by a study of the protozoa of ditch and swamp; their relation to the food supply of higher forms of life.

I. Collecting material:

1. Field trip to swamp and lagoon for collecting material.

NOTE.—Select materials from (a) decayed plants; (b) living plant; (c) bottom ooze; (d) free water. Keep this material in separate bottles or jars.

II. Microscopic examination of material:

1. Examination of each collection.
2. Identification and drawing of typical cell forms.
3. Life habits—food, movement, increase.
4. Indications of distribution of these forms in the different material.
5. Estimation of number of forms in selected quantity of water.

III. Study of cell structure:

1. Parts recognizable in the several forms examined—their function.
2. Modification of parts.
3. Compare simple cell forms with cells of multicellular forms.

References: *Aquatic Microscopy for Beginners*, Stokes; *Animal Life*, Thompson; *Animal Life*, Jordon; *Biology*, Sedgwick and Wilson.

Museum Course: Insect life with special reference to preparations for winter.

I. Collections:

1. Study of winter homes in general.
2. Study of winter homes as grouped about decayed wood, bark of tree, rubbish pile, etc.

II. Field work; observation and collection of material:

1. Places selected by insect as winter abode.
2. Nature of homes, source of material.
3. Evidence of forethought in selecting location.
4. Changes of insect after going into winter quarters.
5. Protection.

III. Arrangement and mounting of collected material:

1. Point to be illustrated by the mounted specimen.
2. Material needed as aid in showing environment of the insect.

IV. The use of labels, reading references, and pictures as supplements to a collection.

The Primary and Grammar School

Continuous observations will be made upon the various phenomena of nature as presented by the succession of day, month, season and year. The course will include, also, a general survey of the various means by which man makes use of natural forces. Laboratory work and apparatus-making will be employed whenever the pupils may desire such means to be employed in testing or verifying the observations made.

The first month of the school year will be devoted largely, throughout the Department, to preparing apparatus, charts, and other materials needed in making and recording daily observations. The study will be directed specially to the mechanics and physics of the instrument employed, so that observations may be intelligently made. For detail outlines refer to the syllabus of each grade. The work is pursued in accordance with the following principles underlying presentation and expression. It is comprehended under the general term

Nature Study

Nature Study is a self-defining term. It is an expression that stands in its simplest form. The spirit of the work requires that the learners be intelligently directed in a study of their immediate environment in its relation to themselves; that, under the natural stimulus of a desire to know, there be a constant effort to rationally interpret the inter-relations of the common things that may be observed.

The work in Nature Study in the Chicago Institute in all grades will be conducted in accordance with the following general plan:

A. Careful observation of those phenomena of nature which present themselves in the surroundings of the pupils in the course of the year.

B. The use of all those subjects of study, including the laboratory as a means, which are necessary to the symmetrical development of a body of knowledge from the observations made.

The study of nature ultimately resolves itself into a study of energy. The great aspects under which energy may be observed—color, form, and force—are presented to the children through an inquiry into their functions.

As to methods of study and presentation the attention of teachers is directed to the following suggestions:

I. Begin the study with a comprehensive survey of the landscape as a whole.

1. Treat the landscape as an organism, not as a composite of confused facts.

(a) Note its strength: illustrated by the tenacity with which plants and animals hold their respective places.

(b) Note its delicacy of balance: illustrated by the influence of any change, however small, in causing a readjustment of the different parts.

II. Proceed from the landscape to its details; the study should be directed to its related parts, not merely to unrelated fragments. From the whole to the parts in this instance does not mean from the whole to the pieces.

1. Note the underlying unifying influence in the section of the landscape studied. For example, it may be the work of a river or creek; a lake or woodland.

2. Note the smaller units within the larger; for example, different slopes, a marsh or a piece of bottomland.

3. Observe the relation of the smaller units to the whole.

III. The landscape as a composite whole presents several series of aspects, each of which includes a well-defined succession of events.

1. The daily: transitory and irregular. For example, those caused by the movement of clouds, etc.

2. The seasonal: those dependent upon the temperature changes and other climatic influences.

3. The epochal: those requiring great lapses of time; for example, the drainage of a marsh; the shifting of a stream-bed, etc.

IV. The study of landscape details therefore means the following of each minor unity, through each of these series of aspects as the changes occur, with due regard to the relations of the various aspects to each other.

1. Illustrated by the study of a tree.

(a) Daily aspects: play of light and shade due to clouds, sunshine and wind.

(b) Seasonal aspects: those corresponding with the month and season.

(c) Epochal: those presenting themselves in the trees' growth, maturity, decline, and dissolution.

The landscape as a whole or any part of it presents similar changes in the same order.

V. The different series of aspects presented by the landscape appeal to the pupils in accordance with a definite order.

1. The fleeting aspects appeal earliest, through the esthetic sense.

2. The regularly recurring seasonal aspects in their relation to man rouse strongly the notions of utility. Observe the multitude of inventions and devices by which man seeks to adapt himself to the seasonal changes.

3. The significance of the great epochal changes appeal most strongly to the mature mind; it can be grasped only as the mind acquires power to arrange according to the rules of philosophy what has been gathered by the senses.

VI. Use the laboratories, collections, and special apparatus as means of answering questions which nature asks the pupils.

The laboratories, aquariums, alcoholic and dry specimens and apparatus enable the pupils to study phenomena in isolation or under special conditions for the purpose of determining the natural relations.

In Nature Study it is indispensable that adequate and intelligible records, corresponding to the modes of observation, should be carefully made and preserved. Such records may be grouped as follows:

I. Color. Records made in water-colors and colored crayon.

1. Pictorial history of the year in color. Below the fifth grade, a series of paintings showing the various aspects presented by the landscape. (See V, above.)

2. Above the fourth grade, daily paintings

of the landscape mounted in calendar form, month by month. Taken together these show the color aspects of the day, the month, the season and the year.

3. The disks are to be of colored paper, about two inches in diameter, each of which will suggest, somewhat arbitrarily, certain conditions of the weather. The following colors, named according to the *Bradley Educational Colored Paper*, are used: (a) Clear days, yellow; (b) fair days (three-tenths clear), orange yellow; (c) cloudy days, cool, gray, No. 1; (d) rainy days (.01 inch, or more), cool, gray, No. 2. First frost in autumn and last in spring, small white disk in the center of the large one; (f) snow, white. By properly dividing each disk into two parts the relative length of day and night may be shown—two different colors being used. An arrow drawn across the face of the disk will indicate the direction of the wind. The disks are pasted, day by day, upon a large cardboard in calendar form, and, thus arranged, they show in a very instructive way the distribution of sunshine, clouds, rainy days, etc., during the months, the seasons, and the year. The value of the record is much enhanced when it is kept in connection with the landscape painting mentioned above. The disk charts represent the cause, the landscapes the effects.

II. FORM. Records made by modeling in clay, and by drawings in charcoal, crayon, and pencil. Also by means of brush and colors.

1. Form in an organism or an object represents a concession to the influence of environment.

2. Form in maintaining itself represents a balance of forces and furnishes a means for measuring them.

3. Form-study is therefore mathematical; arithmetic investigates magnitude, geometry proportion, and algebra the balance of the parts.

4. Accessories needed: English and French units of measure of magnitude—rules, dry and liquid measures, scales and balances.

III. FORCE. Records generally assume the form of tabulated mathematical data. They may also be graphically represented by means of curves upon appropriately drawn charts.

1. As form is imaged only through a mathematical calculation and statement of magnitude, so force is imaged only through a mathematical calculation and statement of quantity.

2. Force is imaged only in mathematical terms, as pull or push, in pounds, grams, etc.

3. Accessories: scales, weights, spring balance, etc. All apparatus made is but a means of utilizing force for one purpose or another.

IV. TIME. Written records showing the duration and succession of natural phenomena. Also supplemented by means of graphic representation in chart form.

1. Meteorological record: showing various phenomena of the weather and the character of the season.

2. Graphic representation of distribution of sunshine, clouds, and rain, by means of colored disks of paper mounted in calendar form on cardboard.

V. Inferences, personal reflections, etc.: Written records. Written language furnishes the best means of making a record in a logical form.

1. Written records embody primarily what the mind works out through reflection.

2. The materials forming the basis of reflection are gathered through observation and supplemented by reading.

3. The records must be preserved and placed to the credit of the pupils.

VI. Reading and literature: A means of access to the experiences and feelings of other people and other times. Observation demands reading; the wider the observation, the greater the demand.

The introduction to reading is through the oral narration. The ability of the child soon outruns his dependence upon the oral narrative and the only substitute is the printed page. Reading, therefore, from the earliest moment should supply the real demand; *i.e.*, the pupil's desire to know concerning those experiences and feelings of others that are kindred to his own. Reading should never be a question of words, never a matter of vocabulary; but always a question of sense, always a matter of intelligence.

Pedagogic Course in Physics

First Year

Meteorology: (a) The province of meteorology. (b) Brief sketch of the growth of the study. (c) The modern contrasted with the early study of the subject. (4) Meteorological phenomena. (e) Meteorological instruments. (f) Construction and use of meteorological instruments. (g) Meteorological observations. (h) Barometer, barograph, thermometers, thermograph, anemometer, anemograph, hygrometer, rain-gauge. (i) History and growth of the signal service. (j) How to make weather maps. (k) How to read weather maps. (l) How to forecast the weather. (m) The study applied to animal and plant life. (n) The value of the study to commerce.

Pedagogic Course in Chemistry

FIRST YEAR

The Chemistry of Decay· Laboratory work upon material gathered from the field. (a) A determination of the composition of leaves, fruits, and grasses. (b) The changes that take place in decay.

High School Course in Physics

THIRD YEAR

Sound, Heat, and Light: (a) Kinds of vibrations. (b) Media of propagation. (c) Sound waves, heat waves, and light waves. (d) Interference, reflection, and refraction of waves.

High School Course in Physics

FOURTH YEAR

Magnetism: (a) Magnets. (b) The earth's magnetism. (c) Magnetic units.

Geography

Zonia Baber Wallace W. Atwood

Pedagogic School

The year's work will be the study of the Chicago field from the geographical and commercial aspects; also a similar consideration of the wider field of the continents of North America, South America, and Eurasia.

I. Value of Chicago and its environs as a basis of geographical study.

1. Genesis of forms of land and water.

2. Working forces: (a) Wind. (b) Waves. (c) Rain. (d) Streams. (c) Weathering agents.

3. Man's adjustment to this region: (a) Farming; gardening. (b) Quarrying; mining. (c) Cities; industries. (d) Commerce.

Which aspect appeals most directly to each grade of pupils?

II. Special study of stream work as shown in the small streams in the region of Glencoe and the Desplaines River.

1. Measure work of a stream done in a certain time: (a) Means of accomplishing the result: wearing power, carrying, and deposition.

2. Registration of stream work on the face of the earth in valleys of various shapes. (a) Relation of the shape of a valley to its erosive history.

3. Bed of stream. (a) Falls, rapids, and other incidents.

4. Effect of stream deposition at debouchure.

2. Use of rivers to man, to animals, to vegetation, to earth. Make valley forms, deltas, etc., in out-of-door laboratory.

NOTE.—Apparatus consists of small pond of water and hose of different sizes for conducting the water into streams.

III. Value of laboratory in teaching geographical subjects to pupils.

References: *Geography of Chicago and Its Environs*, Salisbury and Alden; *Physical Geography*, Davis; *Physical Geography*, Tarr.

First Year, High School

Physiography of the Land:

During the month as many field trips will be taken as is practicable, and the classroom and laboratory work will be based upon the observations made in the field.

I. Weathering, or soil-making.

1. Soils and subsoils: (a) Color. (b) Thickness. (c) Constitution. (d) Distribution.

2. Relation of loose, mantling material to underlying rock of region. (a) Did the mantle